

Claims

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1. ✓ A process for the industrial conversion of carbohydrates, alcohols, aldehydes or polyhydroxy compounds in aqueous phase, which comprises carrying out the conversion catalytically using a metal catalyst formed from polymer-stabilized nanoparticles.
 2. The process as claimed in claim 1, where the conversion is an oxidation.
 3. The process as claimed in claim 2, where glucose, fructose, sorbose, sucrose and/or isomaltulose is oxidized.
 4. The process as claimed in claim 1, where the conversion is a hydrogenation.
 5. The process as claimed in claim 4, where reducing sugars are hydrogenated, in particular glucose, fructose, xylose, sorbose, isomaltose, isomaltulose, trehalulose, maltose and/or lactose.
 6. The process as claimed in claim 1, where the conversion is a reductive amination.

7. The process as claimed in claim 6, where reducing sugars are reductively aminated, in particular, glucose, fructose, xylose, sorbose, isomaltose, isomaltulose, trehalulose, maltose and/or lactose.

8. The process as claimed in any of claims 1 to 7, where the metal is a noble metal, e.g. platinum, palladium, rhodium and/or ruthenium.

9. The process as claimed in any of claims 1 to 7, where the metal is a base metal, in particular, copper and/or nickel.

10. The process as claimed in claim 8 or 9, wherein the metal catalyst used is a monometal catalyst.

11. The process as claimed in claim 8 or 10, wherein the noble metal catalyst comprises platinum or a platinum alloy.

12. The process as claimed in any of claims 8 to 11, wherein the metal catalyst comprises at least two metals.

13. The process as claimed in any of claims 8 to 12, where the metal catalyst has at least one promoter metal.

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14. The process as claimed in any of claims 1 to 13, wherein the nanoparticle-stabilizing polymer is added to the aqueous phase continuously or at suitable time intervals.

15. The process as claimed in any of claims 1 to 14, wherein the metal catalyst used is polymer-stabilized nanoparticles held in a membrane arrangement.

16. The process as claimed in any of claims 1 to 14, wherein the metal catalyst used is polymer-stabilized nanoparticles immobilized on a support material.

17. The process as claimed in claim 16, wherein the polymer-stabilized nanoparticles are immobilized in a gel structure.

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18. The process as claimed in any of claims 1 to 3 and 8 to 17, where the products obtained during the oxidation are removed and obtained continuously from the reaction system by means of electrodialysis.

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